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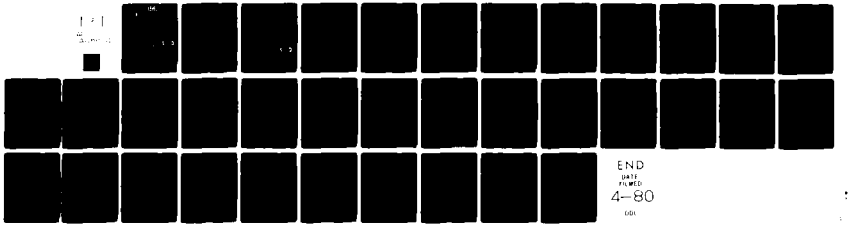

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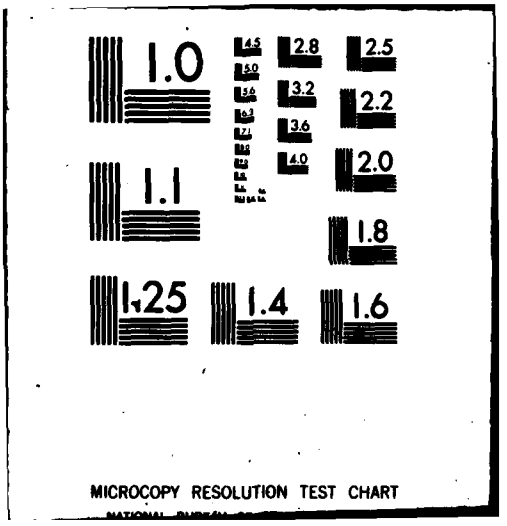
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Aberdeen Proving Ground, Maryland

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For DA, ODCSLOG, an intensive 18-month study was made of the retail repair parts system. The problem addressed was whether the human performance demands of the system were compatible with the abilities of the soldiers. Selection criteria, appropriateness of training methods, consistency in manning of repair parts supply support activities across DA TOEs, inconsistencies in doctrinal publications on supply procedures, and potential system performance improvements from increased proportions of female soldiers in repair parts supply were studied. To identify and learn the significance of specific human performance

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problems, observation and data collection visits were made in CONUS and USAREUR to 10 divisions, 7 major non-divisional units, and 83 company PLLs.

There were 11 principal findings although, in general, it was found that the repair parts supply system is too complicated for the current soldiers, of all grades, to operate. Of course, the system includes the selection, training, and doctrine subsystems.

Specific recommendations are made that narrow the gap between system demands and soldier abilities in the short term, and that will close the gap in the future.

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Technical Memorandum 3-80

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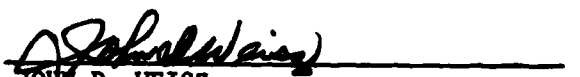
APPROVED: 

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PREFACE

Accompanying this summary volume is the complete final report, Volume II, which includes the detailed descriptions of study objectives, assumptions, methods, and results. While this summary includes the specific recommendations in the Appendices, one should refer to the complete report for the rationale that supports each recommendation.

INTRODUCTION

This study was to find and resolve problems in the repair parts supply system that had led to widespread lack of confidence in the system's ability to provide needed repair parts. The report of the Tank Forces Management Study led by LTG Kalergis had findings in two sections related to repair parts:

> LOGISTICS - "The current system of providing repair parts is marginally adequate in peacetime. It is doubtful that it can provide responsive support to wartime armor operations." (Kalergis, et al., 1977, p 3-14) "Confidence in the logistical system is at a low level." (p 3-45)
>
> TRAINING - "Entry level training for PLL and TAMMS Clerks is too general and does not produce personnel technically qualified for their initial entry duties." (p 4-11)

Grave concerns were similarly expressed by MG Hill, a recent Deputy Commander of the III Corps at Fort Hood, TX. After reviewing many problems and offering several recommendations, he concluded that "the alternative to the corrective action suggested will be to observe a rapid deterioration, due to lack of spare parts, in the combat power of our force when committed to battle." (Hill, 1979)

In identifying the cause for the problems in the system, some in the logistics community have felt that the problems all stemmed from inadequacies in training. In response, the training community has replied that the logistic designers have created a system much too complicated - one that the average soldier cannot comprehend even with excellent training.

In January, 1978, faced with these opposing views, the Supply Branch, Supply and Maintenance Policy Division, DA ODCSLOG, reviewed studies ongoing at that time to determine if any would resolve the major problems attributed to the repair parts system. Concluding that most of the problems were related to human performance issues and would not be addressed by the ongoing studies, the US Army Human Engineering Laboratory (HEL) was asked in March, 1978, to study the problem. Specifically, the HEL was to evaluate the validity of the human performance related aspects of the design of the repair parts supply system. To guide the effort, a Study Advisory Group was formed with the representation shown in Table A. Initiated with receipt of funds in July, 1978, the study was completed in November, 1979.

Table A. SAG Organization

Chairman - MG Nord, Director of Supply and Maintenance, ODCSLOG

Deputy Chairman - COL Kelly (COL Stalcup), Chief, Supply Policy Division, ODCSLOG

Study Sponsor - LTC Hospodar & LTC Hutcheson, ODCSLOG

Members -	LTC Wooten	DA, ODCSPER
	Mr. McDaniel	DA, DCSLOG (PLS)
	COL Taylor	TRADOC
	Mr. Mills	LOG C
	LTC Akin	FORSCOM
	MAJ Kirby (MAJ Baird)	USAREUR
	Mr. Snowden (Mr. Kelly) (Mr. O'Neill)	DARCOM
Observers -	LTC Bertelkamp	ODUSA(OR)
	Miss Harvey (Mr. Campo)	OASA (IL&FM)
	Mr. Smith (Mr. Hassis) (Mr. Schrait)	ODCSLOG
	LTC Rochon (MAJ Zschoke)	PAED
	Dr. Dunn	Study Management Office
	Mr. Bona	ACSAC
	LTC Norman	ODCSOPS
	COL Craven & LTC Durbin	TFMO
	LTC Robinson (MAJ Fischer) (SGM Southall)	Armor Center
	LTC Holcomb (MAJ Chippes) (LTC Sirois)	ARNG

The scope of the study was using units through corps level and was to include the full range of human factors: selection criteria for system operators and managers, training methods, organization design, and human engineering of forms, procedures, and man-computer interfaces. Since there were so many strong opinions about faults with the system, it seemed essential that the focus of the data collection should be quantitative to allow objective analysis to identify and decide the significance of problems. It was felt that a strong quantitative orientation would be better even if some of the data collected was not directly applicable to what would materialize as human performance problem areas. Finally, since much of the motivation for this study had come from those representing the Tank Forces, the study was oriented toward mechanized units.

STUDY METHODS

Observation Visits. For preparation, the study team spent much of the first weeks of the effort studying Army regulations, field manuals, training circulars, and technical manuals that are the policy and procedural doctrine of the system. To complete this orientation, visits were made to several units in CONUS for observation of repair parts operations and for discussions with using unit, direct support, and command and staff personnel about their perceptions of the system problems. These two- or three-day visits to the 4th Infantry Division, the 3rd Armored Cavalry Regiment, the 9th Infantry Division, the III Corps, and the 194th Armored Brigade were made to further familiarize the study team with system problems, and also to enable a preliminary identification of system problems on which later data collection efforts could be focused.

Data Collection. Different strategies were used for data collection in using units and at direct support and higher levels. To consider the significance of complexity of references, the large number of supply sources, adequacy of supervision, depth of training, and other alleged problems in the using units, each factor had to be studied in relation to the task requirements of the job. Since the job tasks and especially task volume were not known from the study of doctrine, it was clear that these questions would need objective answers. As there was the suggestion from the observation visits that workload may be a serious problem, it was decided that time studies be conducted as a means of detailed observation. Questionnaires to be used in structured interviews were also prepared for PLL clerks, motor sergeants, and battalion maintenance technicians to be administered in the battalions where PLL clerk time studies were conducted.

There were different data collection requirements at the direct support and higher levels. The structures of direct support organizations vary widely, especially between divisional and non-divisional units. The direct support units also have a large proportion of senior NCOs and warrant officer technicians ostensibly doing management-oriented, non-repetitive work. With this situation existing, the data collection effort was arranged in four parts: first, the detailed working organization structure, not necessarily the approved MTOE, was recorded in each supply support activity. Non-TOE concentrations of personnel in certain functions found across many direct support units would be symptomatic of difficult functional problems in that area. Second, commissioned officers, warrant officers, and senior NCOs were interviewed to learn their technical qualifications and service background. Then, the key personnel, usually section or branch chiefs, were questioned on their procedures for accomplishing their functional tasks. This interview on functional procedures followed a data item list of several hundred items and included questions about any problems encountered in their work or that they perceived in the system as a whole. Any measures of performance that the supply support activity made or maintained that reflected their own or subordinate operations were requested in addition to standard statistical reports such as those produced by DLOGS. Finally, certain samples of warehouse location and inventory accuracy, the accuracy of stock selection and placement in customer bins, and DX and other computations for stockage requirements were made to obtain independent performance estimates across units.

The initial phase of data collection was in CONUS. Two weeks were spent at the 4th Infantry Division, the III Corps, and the 3rd Armored Cavalry Regiment with PLL time studies conducted in three battalions or squadrons at each site. Three to six PLL clerks were studied simultaneously in each battalion. At the III Corps, direct support operations were studied in both divisions and general support was reviewed in the COSCOM.

The second data collection phase was in USAREUR where all four full divisions and several major non-divisional units were visited. Spending two or three days per major unit, the primary objectives were to study the repair parts operations in the more dispersed European environment and to see the effects of this geographic separation on human performance. A second objective was to quickly build a sample of supply support activities studied. The schedule of units visited is in Table B.

Table B. Identification and Dates of Major Units Visited.

OBSERVATION VISITS	
4th Inf Div (Mech), Ft. Carson, CO	29 AUG-1 SEP 78
3rd Ar Cav Reg, Ft. Bliss, TX	6-9 SEP 78
9th Inf Div, Ft. Lewis, WA	12-15 SEP 78
III Corps, Ft. Hood, TX	14-17 NOV 78
194th Ar Bde, Ft. Knox, KY	8 DEC 78
24th Inf Div, Hunter AAF & Ft. Stewart,GA	22-23 MAR 79
101st Inf Div (Air Assault), Ft. Campbell, KY	8-9 NOV 79
OBSERVATION VISITS - USAR	
244th Engr Bn, Aurora & Rocky Mountain Arsenal, CO	13 JAN 79
807th Med Bde, Dallas, TX	3 FEB 79
493rd Engr Grp, Dallas, TX	3 FEB 79
DATA COLLECTION - CONUS	
4th Inf Div (Mech), Ft. Carson, CO	8-19 JAN 79
III Corps, Ft. Hood, TX	29 JAN-9 FEB 79
3rd Ar Cav Reg, Ft. Bliss, TX	20 FEB-2 MAR 79
DATA COLLECTION - USAREUR	
HQ, USAREUR	9 APR 79
HQ, V Corps; 19th MMC	10 APR 79
HQ, 32nd AADCOM	11 APR 79
HQ, VII Corps; 800th MMC	12 APR 79
HQ, USAREUR; 32nd AADCOM	13 APR 79
3rd Ar Div	17-18 APR 79
42nd Arty Grp	19-20 APR 79
11th Ar Cav Reg	23-24 APR 79
8th Inf Div (Mech)	25-27 APR 79
1st Ar Div	30 APR-1 MAY 79
32nd AADCOM	3-8 MAY 79
800th MMC	4 MAY 79
3rd Inf Div (Mech)	9-11 MAY 79
19th MMC	11 MAY 79

SELECTED QUANTITATIVE RESULTS

At the unit PLL level, it was found that 25% of requests are rejected by division editing programs on the first attempt and the number of PLL lines at zero balance in the units visited was 12% to almost 20%. In the structured interview, 33% of the PLL clerks said that they used the AMDF (the microfiched catalog) to verify data on just some of their requests rather than all requests, just 38% identified the motor sergeant as their supervisor as called for in the TOE, and 46% identified some other individual as the sole supervisor. Although use by the PLL clerks of the provided prepunched request cards would reduce the opportunities for key punch errors by almost half, the proportions of requests that were prepunched in two divisions were 1.8% and 5.2%.

From the PLL document registers, it was found that the mean time to receive an Ø2/Ø3 priority part in divisions is 11 to 14 days with standard deviations somewhat higher than the means. The mean time to receive a lower priority part is 22 to 27 days with a standard deviation of 18 to 33 days. This says that relatively few parts are received in the 3 to 5 days expected for a fill from the ASL.

Looking at performance on intermediate processes at supply support activity level, a sample taken by the study team indicated that location accuracy in division main technical supply offices (TSOs) was 82% and was 87% in non-divisional TSOs. Even with a very generous allowance for transactions occurring after the latest posting of stock status, inventory accuracy was found to be only 55% in division main TSOs. In 15 forward support companies in 5 divisions, the average accommodation was 46%, average satisfaction was 57% and the average fill rate was 26%.

OTHER ANALYSES

During the period of coordination for data collection, analyses were conducted on a number of subjects. The objectives and methods of the analyses on training methods, selection criteria, and comparison of doctrinal material are summarized below.

Training. Because so many officers and senior NCOs blamed AIT training, especially the non-lecture training methodology, for the ills of the repair parts system, the training methods used in the 76D AIT course were critically reviewed. In late 1978, students in the 76D AIT course were

generally of lower aptitude with the classes having a high proportion of category IV and lower category III students. A study in 1973 by HumRRO on the training of low aptitude soldiers recommended that such training programs have seven attributes: immediate feedback; training method that has inherent feedback qualities; reduced reading; high rate of student responses; short units, on the order of fifteen minutes or less; learning activities that are manipulative; and a high rate of interaction between the students and the instructors.

With the predominantly lower aptitude 76D AIT students, these criteria should have been applied. The methodology used, however, for 11 of the 12 weeks of the course was programmed instruction using a written text. Whereas programmed instruction should have a high rate of response and provide immediate knowledge of results, the 76D text did neither consistently. To summarize the comparison of 76D AIT methods with the HumRRO recommendations, the 76D course did not always give immediate feedback, had a method with inherent feedback characteristics that were obviated in implementation, emphasized rather than minimized reading, had long units with low rates of response, had only one week of clearly manipulative activities, and had moderate interaction between the students and instructors.

Selection. Several important findings were made in reviewing the selection process for AIT students. First, at the beginning of the study, the selection criteria for the 76D MOS was a clerical aptitude of 90 on the Army Classification Battery. The 76D is a difficult MOS due primarily to two factors. The PLL clerk position, although highly visible, is but one of seven 76D duty positions. The other factor is that in either the PLL or TAMMS clerk positions, the 76D enters a unit expected to perform as a journeyman since his supervisor is not a higher skill level in the same MOS. By comparison, the 76Y AIT graduate enters a using unit with the title of armorer but functions in every way as an understudy to the unit supply sergeant. The 76Y clerical aptitude minimum was 95 at the beginning of the study, five points higher than the 76D. Both minimums have since been raised 5 points.

Two other situations weakened further the value of the selection criteria. Although MILPERCEN uses AIT attrition rates as the indicator of need to raise or lower the selection criteria, former and incumbent instructors at the QMS during

the 1978-79 period indicated that the maximum failure rate allowed was 15%, thus nullifying the value of this adjustment criteria to MILPERCEN. Second, the QMS had accumulated statistics indicating that the validity of the clerical aptitude score in predicting AIT success was only .33 compared to the .68 predicted by the developers of the ACB.

The selection criteria obviously served little purpose.

Doctrinal Material Analysis. Inconsistencies were evident in the study team's early close reading of various doctrinal statements. These were felt to be of no consequence until competent PLL clerks in the observation visits repeatedly suggested that the local procedures were not according to the procedures they had been taught in QMS, or for the self-taught PLL clerks, according to the doctrine they had read in learning the job.

For this and other reasons, a careful comparison was made of all relevant doctrinal sources for the procedures and forms required of a PLL clerk. Considered were ARs, TMs, FMs, and the QMS text for the PLL clerk portion of the 76D AIT course.

The findings were disturbing. The number of steps given for requests for issue of a PLL item varied from 3 in AR 710-2 to 11 in the 76D text and the DLOGS manual. For a request for issue of a DX item, the number of steps varied from 5 in FM 29-2 to 16 in the DLOGS manual and our own field observations indicated 18 steps were actually required in most field situations. Similarly, looking at the number of entries needed to complete a form, FM 29-2 indicated 13 entries were required to complete a DA Form 2765 (Manual) for a request for issue while the DS4 manual and the QMS texts indicated 17 and the HEL observed 18 usually required in units. On the DA 2402 "shoe tag" used in DX transactions, the 76D text said 13 entries were required but the DS4 manual and observed field practice both indicated 16 entries were required.

With disagreement among AR, FM, and TM sources, it is not easy for AIT text writers to know what is right. Similarly, IG, MAIT, and other personnel required to learn, teach, and enforce doctrinal procedures can very easily inspect by a standard that is contrary to another valid standard used by a conscientious unit PLL clerk.

FINDINGS

The findings are based on the observation and data collection visits to 83 company sized PLLs, 10 divisions, and 4 major non-divisional units, and on the resulting quantitative and other analyses. Stated briefly, there were 11 principal findings, 6 for using units and 5 for the supply support activities.

In sum, it was found that the retail repair parts supply system was too complicated for the incumbent soldiers to properly operate. This assumes that selection, training, and doctrine are subsystems of the retail repair parts supply system and applies to the 1978-79 period of the study. The implementation of DS4, a system built on the same man-system interfaces as DLOGS and one reported to be more complex, promises to make wider the gap between the demands of the system and the abilities of the soldiers.

The 6 principal findings for using units are:

(1) PLL performance is uneven. While in almost every battalion visited there were one or more PLLs that appeared to be active and well maintained, there were as many or more that showed significant evidence of haphazard operation.

(2) The PLL doctrine and procedures do not form an integrated job, making the work overly complicated.

(3) Substantial improvements can be made in AIT training for PLL clerks.

(4) The selection criteria for the PLL clerk MOS is too low for the degree of supervision, responsibility, complexity, and breadth of duties compared with other MOSs.

(5) Supervision of PLL is usually inadequate.

(6) There is no PLL performance feedback, making supervision and management difficult.

The principal findings for the supply support activities were:

(1) The supply performance of supply support activities, especially in divisions, is less than desired.

(2) The doctrine and procedures for divisional SSAs are function or process oriented and do not form a coherent series of integrated jobs. This causes the procedures to appear overly complicated.

(3) Divisional and non-divisional supply support activities are lacking in technical management and supervisory

expertise either through inadequate personnel authorizations or insufficient experience and training of senior personnel on hand.

(4) Improvements in SSA management can be made by providing management information related to day-to-day operations.

(5) The current state of the supply section of most forward support companies is not consistent with their anticipated peace and wartime functions.

RECOMMENDATIONS

For both using units and SSAs, specific recommendations, totaling 75, were made and are included in the Appendices. In the area of doctrine and procedures, these recommendations seek to simplify the jobs and to integrate the procedural doctrine around jobs rather than around the arbitrary topical scope of doctrine documents. Recommendations are made to strengthen supervision through increased training of NCOs and officers holding positions in repair parts supply and to simplify management by providing information from automated systems needed for day-to-day decision-making as well as for long-term planning. Great improvements can be made in system performance by changes in the training and selection subsystems. To continue to consider PLLs and ASLs as stocks of tactical value, practical, workable provisions must be made for their rear and forward area mobility.

CONCLUSIONS

The problems in the retail repair parts supply system did not develop overnight. DLOGS as it was implemented a decade and a half ago was relatively simple and straightforward. While the average ability of today's soldier compared to that of the mid-1960s may be debated by some, it is fair to say that the unit commanders of the mid-1960s were likely able to place a soldier with several years of college in the place of a less fortunate supplyman not quite able to keep up with an automated system. As commanders lost this pool of college trained soldiers that could be placed in trouble spots, the repair parts supply operating environment became much more constrained. Rigorous financial management, property accountability, and a leaner Army have made the system less forgiving to errors. Improvements in the retail system such as QSS and, with more profound effect, improvements for greater efficiency at the wholesale level have made the system more complex. As each decision was made that resulted in added complexity or tighter constraint, no single manager had, or made available to himself, both the detailed knowledge of the system and the changing nature

of the Army to realize the consequences. Unfortunately, the sum of the small decisions on details and procedures was vitally important.

In the short-term, changes in doctrine and training can be made quickly to make narrower the gap between the abilities of soldiers and officers and the demands of the complex system. Implementation of the recommendations will narrow the gap enough to make noticeable, significant improvements in repair parts supply performance. This implementation will take attention to detail, changes in attitudes, and expense, but will bring about the needed improvements in performance, restoration of confidence, and greater readiness.

Beyond this, there is no reason why new technology cannot be applied to the development of a new repair parts system with simple man-system interfaces as a cornerstone. The new automation programs that are in development are oriented around computer hardware and software systems rather than around man-computer systems. This is unfortunate since the soldier ability - system demand gap in the supply system will widen due to rising demands for high ability combat soldiers to man the new, complex weapons systems of the 1980s. Development of a human-oriented repair parts supply system should begin in order to meet this inevitable ability - demand disparity.

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USING UNIT LEVEL RECOMMENDATIONS

The recommendations are categorized into sections dealing with doctrine and procedures, supervision and management, training, selection, and mobility. Within each category, the recommendations will be ordered by a very approximate phasing that indicates the study team's view of both the importance and necessary development time to effect the change. Phase I is a short-term meaning 6-12 months, Phase II is the one to two year mid-term, and longer term items are noted in Phase III.

Doctrine and Procedures

Phase I

1. Require a Monthly PLL Review to include:
   (1) Validation of mechanic's need,
   (2) Reconciliation of Due-Out List with Document Register
   (3) Inventory PLL and submit inventory copy to SSA
   (4) Request replenishment of inventory.
2. Change doctrine to say explicitly that 4 weeks or 2 Due-Out Lists, whichever is longer, must pass without including a request before it may be assumed lost, and canceled and re-submitted.
3. To simplify the PLL Clerk job, require that DX and QSS lists be combined, in NIIN sequence. This list should include all lines that require exceptional processing such as those obtained through local purchase or local fabrication.
4. Include any summary of demands with PLL Change List and issue PLL Change List quarterly, to coincide with a Monthly Review.
5. Simplify the PLL Change List by (1)eliminating unnecessary information and (2)substituting prose or abbreviated English words for codes. Where information for a PLL line exceeds 1 output line, use 2 or more.

6. To provide management information for unit Motor Officer or CO, include critical Non-PLL Requests, i.e., NORS demand history, with PLL Change List.

7. Improve utility of PLL List by (1)eliminating unnecessary information, and (2)replacing codes with abbreviations, thus creating increased space for manual uses of the PLL List.

8. Change the Document Register, DA 2064, to include column for price and additional space for high priority signatures; or set Army standard for format of price information.

9. Change designation of all publications bearing on PLL to AR, FM, or TM status to facilitate distribution. This will primarily affect CDA code reference guides.

10. Delete requirement for PLL Clerks supported by DS4 to maintain a Due-In suspense file emphasizing requirement to post latest status to the Document Register.

Phase II

11. Provide PLL Clerk a listing after each DS4 cycle of the status of all requests submitted for that cycle, all other transactions submitted for that cycle, and all transactions outstanding that have not been previously indicated as released for issue, passed, or backordered.

12. Extend automated support to DX, eliminating manual record of demands, second source of parts, and the DA 2402.

13. Integrate stock and financial accounting systems to provide PLL Clerks with one set of records from one distribution source.

14. Combine all doctrine bearing on PLL into one document or make one document the key to the job, making specific references to other publications. This document would be updated with the same frequency as the relevant AR.

15. Provide Unit Commanders, Motor Officers, and Motor Sergeants with commanders guide or section in organizational maintenance FM that: (1) summarizes PLL procedures
    (2) lists all pertinent references with descriptions of topics covered
    (3) describes inspection & supervision technique

16. Consider giving DA guidance for monetary turn-in credit to unit COLEX/CAMUS/TUFMIS/STANFINS accounts.

17. Provide PLL Clerk near-immediate feedback as to request and other transactions accepted. This should be accomplished at the FSU at the time of transaction submission. A device like the Division Level Data Entry Device (DLDED) would accomplish this.

Supervision & Management

Phase I

1. AR 611-201, Enlisted Career Management Fields and Military Occupational Specialties, includes descriptions of qualifications and duties for each MOS at each skill level. For 63B/C30, change "Requisitions spare parts, tools, and supplies." (pgs 3-63-13 to 3-63-17) to "Supervises and instructs PLL Clerk in requesting, storage, issuance, and accounting for repair parts. Supervises and instructs TAMMS Clerk in the upkeep of maintenance records. Arranges for request of tools and supplies."

2. In AR 611-201, include supervision of repair parts supply as a duty for 63C40.

3. Develop, distribute, and encourage MACOMS to use exportable training package on repair parts studies for motor sergeants and motor officers. Course should be 40 hours with at least 24 hours on DS4 procedures.

4. Modify the 320-hour Junior Officer Maintenance Course (8C-77D, Armor School), syllabus to increase repair parts instruction from the current 11 hours to 40 hours with at least 24 hours on DS4 procedures.

5. The DA policy for PLL arrangement is separate PLLs for each company in mechanized battalions. Co-locating PLLs within battalions should be permitted only for short periods and should be discouraged. Consolidated battalion PLLs is not DA policy and exceptions by MACOMS should be limited.

Phase II

6. Consider requiring advanced NCO course for, or as prerequisite for, E663C30 which would include 40 hours of repair parts instruction with at least 24 hours on DS4 procedures.

7. Consider requiring attendance at Basic Warrant Officer Course for newly appointed 630As. Include 40 hours of instruction in repair parts supply with at least 24 hours on DS4 procedures.

8. Provide unit motor officer information to monthly to help in his management of the PLL to include:

   - number of requests for the period, total and by IPG
   - number of NORS requests
   - unit to SSA request processing time
   - monetary value of requests
   - monetary value of receipts
   - average number of transactions per DS4 cycle
   - average age of requests submitted
   - average number of DLOGS cycles between dates of unit transactions
   - average DS4 cycles per week for the period
   - maximum unit transactions for a cycle during the period

- number of requests rejected, classified by type of error
- number of requests that were PLL replenishment
- summary of other transactions, AØB, AØE, AC1, DHA etc.
- number and value of excess items on hand
- summary of reconciliation statistics such as number of cancellations as a result of reconciliation, number of requests due-in to unit, extended dollar value of due-ins to unit.

Training

Phase I

1. Improve the PLL Clerk AIT instruction by rewriting students' texts to make them more consistent with the accepted principles of programmed instruction. The texts should present and then require reinforcing responses on elements of information, should repeat material frequently, should have short units, and have consistent knowledge-of-results feedback. A portion of the 76D AIT text has been rewritten to conform with programmed instruction principles and is presented in Appendix K of Volume II.

Phase II

2. Improve the AIT instruction for the PLL Clerk duty position by introducing as a significant practical exercise (3-5 days) interaction with a DS4 simulator.

3. Consider training media alternatives to self-paced, programmed text instruction, especially computer aided instruction, and some lecture or conference format instruction.

Selection

Phase I

1. Aptitude selection criterion for PLL Clerk MOS should be significantly higher than that for the unit supply clerk/armorer. The required Clerical Score should be 105.

Phase III

2. An MOS selection procedure or instrument should be developed with a validity coefficient of .65 or greater demonstrated in large samples of AIT candidates for a variety of CMFs.

Mobility — Develop, test, and field a PLL storage shelter that would mount on a 1½T trailer, would provide storage for all PLL parts except large bulk or heavy items like tires and track, and would provide the PLL Clerk with an organized work place.

SUPPLY SUPPORT ACTIVITY RECOMMENDATIONS

Doctrine and Procedures

TSO

Phase I

1. The divisional maintenance battalion TOEs being developed and proposed by the USAOCC&S (29-26R, -27R, -36R, -37R) provide significantly greater TSO staffing and should be adopted.

2. The proposed TOEs above should be expanded to include a Quality Control Section of 2 E6s and 2 E4s to be centered in the HQ and Lt. Mtnc. Co., all with DS4 ASI.

3. Consider substituting 76V for 76D in receiving, storage, and issuance; and 76P for 76D in QSS and DX.

Phase II

4. Change TOEs to require TSO officers, NCOIC, and section NCOs to have DS4 ASI.

5. Consider raising the grade of main TSO platoon or section leader from LT to CPT to be more comparable with DMMC Class IX Officer.

6. Develop an improved location survey process and procedure that facilitates consolidation of multiple locations. This program is not required to be part of the DS4 cycle.

7. Develop DS4 capability to accommodate multiple locations.

8. Provide an integrated and consistent statement of doctrine and procedures.

9. Improve the MRO, location change card, inventory count cards, and other TSO transaction forms by eliminating information unnecessary for the immediate task, and using English words or abbreviations instead of alphanumeric codes.

Phase III

10. Develop and implement an integrated automated warehouse management system. As a first step beyond the data entry and editing functions of

DLDED, develop automated location mangement at the receiving section, to include available locations sorted by cube, weight, pilferage, security, shelf life, essentiality, and distance from central aisle.

11. Consider further automation in receiving section, such as automated information acquisition.

DMMC

Phase I

1. Conduct a task analysis of all DMMC Class IX jobs to assemble job-specific doctrine and procedures. Develop job descriptions and revised TOE that displays specific job titles and job organization. Examples of the first steps in this task analysis are shown in Tables V-1, V-2, and V-3 of Volume II.

2. Develop job aids for above positions.

3. Provide one or two keypunch machines to DMMC Class IX sections for use by managers.

4. Authorize manual technical edit for manufacturer part number (MPN) to NSN conversions at the SSA and for exception data requests. This authorization would include personnel and technical manual library.

5. Designate an active focal point for collection, evaluation, and distribution of division unique Class IX programs.

Phase II

6. Develop a standard edit program to replace the combinations of the division unique pre-edit program and the DS4 edit module. The new program must compare input transactions with catalog data.

7. Develop a post-edit program for passed requisitions which would equal SAILS in scrutiny.

8. Automate the SSA level MPN to NSN conversions using MCRL 1 or other means.

9. Increase automated support to the Inventory Adjustment Report process. Such support might include a list of previous IARs on a particular line, and a list or summary of transactions for that line for a specified time period.

10. Local purchase and fabrication arrangements should be made by the SSA for, not by, using units.

11. Change personnel assignment strategy within divisions to make assignments to highest percentage shortages rather than highest number shortages.

General

Phase I

1. Insure that the QSS benefits exceed the QSS management expertise, manpower, and storage facility costs by giving SSAs the option to either:

   -Eliminate QSS within divisions, or

   -Implement QSS with these attributes:

   -Quick, i.e., immediate or same day service, at all locations.

   -Only want slips should be used as request medium.

   -500 lines in main and each FSU.

   -Stock same list at each location.

   -Low price items, i.e., $2 limit.

   -Encourage stockage of small parts.

   -High volume, i.e., 50-100 demands/year.

2. Where QSS is implemented, clarify the request routing procedure for multiple QSS location and list situations in DS4.

3. Move the DX stock accounting computation function to the DMMC Class IX Section.

4. Strongly encourage MACOM adherence to the DA standard DX stockage accounting procedure.

5. Simplify and improve the accuracy of the DX stockage computation procedures by eliminating the 22-day month stockage table and by redesigning the remaining tables to provide a longer time period coverage without multiple approximations.

6. Re-write the DX computation procedure to include an operating level. A proposed draft of the relevant sections of the regulation is in Appendix N of Volume II.

7. Publish supply performance goals for divisional forward support companies.

8. At all management levels, give the supply performance data for forward support companies equal visibility to that of the main TSO.

9. Standardize the manual computation, adjustment, and reporting procedures for supply performance indicators among MACOMs. The DS4 Supply Performance Report should be submitted along with a summary of the manual calculations.

10. Delete the adjustment factor for QSS lines from supply performance reports.

Phase II

11. Speed the automation of DX stockage computation and stock accounting.

12. The validity of the performance goals for ASL, DX, and QSS should be verified given the present stockage criteria.

Phase III

13. As dedicated ADP support becomes available, consider realigning the stock accounting function with the supply operations in divisions. Options include simply moving the DMMC Class IX section back to the TSO of the Mtnc Bn's HQ and Lt Mntc Co, form a TSO Company in the Mtnc Bn that would include the DMMC Class IX Section, or move Class IX supply to a Supply Battalion that would have forward support platoons.

14. Develop a system of increased automated support to the SSAs that is human oriented, especially dedicated support such as DAS3 and the concept DLDED, to assist in all functions of the MMC and TSO, including FSUs.

Selection

Phase I

1. An off-line management system of NCO, WO, and Officer personnel trained in DS4 procedures should be established within HQDA to insure fill of key SSA positions by trained personnel.

Phase II

2. The development and fielding of an automated personnel accounting system that handles ASI and SSI codes should be encouraged.

Training

Phase I

1. Encourage attendance of significant number (20-30%) of 76D/P AIT graduates to attend the 2-week T8 DS4 course.

Phase II

2. Develop and implement an Advanced DS4 Procedures Course for E5-E7 and 01-03 personnel. Course should be 4-6 weeks and should include fast-time simulation of SSA operations as a training device.

3. Develop and implement a Professional Automated Supply Course for Warrant Officers and interested E8s. The eight-week course would include:

-theory of retail supply management

-DS4 procedures

-introduction to COBOL 68/74 programming

-introduction to assembly language programming

-introduction to IBM 360/30 and DAS3 operating systems

-DAS3 operating procedures

Supervision and Management

Phase I 1. Emphasize that supply performance of FSUs is to be as intensively managed as that of the main TSO.

Phase II 2. Develop a management information system that gives TSO and DMMC managers and supervisors guidance for their internal, day-to-day operations. DS4 now provides, through the Supply Performance Report which is intended to be run monthly, the following information, by DSU:

-Number of requests

-Accommodation

-Satisfaction

-Warehouse denials

-Number of ASL lines

-Lines zero balance

-Fringe lines

-Number of high priority requests

These indicators are received daily only if the Supply Performance Report is run daily which is not the intent of the automated procedures doctrine. In addition, information elements such as the following should be supplied:

-Measures of DX supply performance similar to the ASL

-Number of post-post transactions

-Location turbulence

-Number of vacant locations

-Location survey results

-Inventory accuracy

-Report of inventory count cards outstanding

-Report of location survey cards outstanding

-Request edit results

-Manager input errors

-Manager referrals outstanding

-DX washout rates

-MRO consolidation list by unit

-PLL to ASL match summary

-Unit reconciliation performance summary

-Request processing time by unit

-Extent of DSU cross-leveling transactions

-ASL turbulence

-Number of part number requests

-Number of receipts processed

-Number of receipt processing errors

-Number of receipts not due-in

V Mobility

The ASL mobility goals should be met with Repair Parts Vans or with systematically designed modification kits for MILVAN or other containers.

PHASED RECOMMENDATIONS BY CATEGORY

	PHASE I	PHASE II	PHASE III
PLL DOCUMENTS & PROCEDURES	- Monthly PLL review	- Automate DX	
	- Monthly PLL Change List	- PLL transaction listing	
	- Revised Document Register to include PRICE	- Integrate stock and financial accounting	
	- All Class IX publications to AR or TM status, esp. microfiches	- Establish DA guidance on monetary turn-in credit	
	- Delete suspense file	- Combine all PLL doctrine in one publication	
	- DX and QSS on combined list in NIIN sequence	- Develop commander's guide for PLL	
	- Encourage separate PLLs	- Immediate feedback to PLL clerk via DLDED or similar device	
MOTOR SERGEANTS	- Include repair parts supervision in AR 611-201 for MOS 63/B/C, 30 & 40 levels.		
	- Develop exportable training	- Advanced NCO course - include 40 hr on repair parts	
MOTOR OFFICERS	- Develop exportable training (same as motor sergeants')		
	- Modify Motor Officer course to include 40 hr on repair parts	- provide Motor Officer with monthly info on his/her PLLs	

	PHASE I	PHASE II	PHASE III
TSO ORGANIZATION & PROCEDURES	- Adopt proposed Maintenance BN TOEs and include a Quality Control section - Substitute 76V in receiving storage & issuance, and 76P in QSS & DX, for 76D	- OIC/NCOICs to have DS4 SSI/ASIs - Raise OIC from LT to CPT - Develop DS4 capability for multiple locations - Provide integrated and consistent doctrine - Improve MRO, inventory & location card, etc, information and coding.	- Develop & implement integrated automated warehouse management system - Automate receiving section
DMMC ORGANIZATION	- Perform task analyses of jobs; develop TOEs that are job-organized; develop job aids - Supply keypunch machine(s) for managers - Authorize technical edit for MPNs - Establish focal point for command unique programs	- Local purchase/fabrication arrangements done by SSA - Increase automated support for IARs - Automate MPN to NSN conversions - Develop standard edit - Develop post edit for SAILS input	- Realign stock accounting and supply operations - Increase automated support that is human oriented; esp. dedicated support like DAS3 and DLDED
QSS	- Eliminate QSS or implement constrained QSS - Rationalized QSS request routing through multiple DSUs		

	PHASE I	PHASE II	PHASE III
WARRANT OFFICERS		- Basic WO course - include 40 hrs on repair parts - Professional Automated Supply Course for WOs and E8s	
AIT TRAINING	- Rewrite 76D AIT to conform with programmed instruction principles - Practical exercise with DS4 simulator - Investigate training media alternatives		
SELECTION & TRAINING	- Selection criterion for PLL clerk at least as high as 76Y - Off line management of NCO/WO/Officer trained in DS4 - At least 30% 76D/P AIT graduates attend DS4 course	- Automate personnel accounting system (ASIs & SSIs) - Advanced DS4 training for E5-7, 01-3 - Personnel assignment by highest percentage vacant instead of highest numbers.	-Develop MOS selection procedure or instrument with a validity coefficient of at least .65.
MOBILITY	- Develop PLL storage shelter - ASL mobility goals met with Repair Parts Vans or MILVANS with modification kits		

	PHASE I	PHASE II	PHASE III
DX	- Move DX stock accounting to DMMC CL IX section - Encourage MACOM adherence to DA DX policy - Simplify DX stockage computations - Establish DX operating level	- Automate DX stock accounting and stock computation	
FSCs	- Establish supply performance goals for FSCs - Give FSCs equal visibility to Main		
SUPPLY PERFORMANCE	- Standardize supply performance indicators. - Delete QSS adjustment factor.	- Validate performance goals - Establish daily MIS for managers in DMMC and warehouse	